

## DISPERSAL OF MUSCA DOMESTICA LINNE.

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The latter part of May, 1913, unusual numbers of flies appeared at the Isthmian Canal Commission hotels and commissary at Balboa, Canal Zone. An inspection revealed a pile of cow manure, etc., about 800 square feet in area, located at one corner of Ancon Cemetery, 2,500 feet distant in direct line from the hotel. This place is indicated by the letter "B" on the accompanying map. This manure was heavily infested with maggots, principally of *Musca domestica*, *Hermetia illucens*, *Volucella obesa*, and *Paralucilia macellaria*. Puparia were very abundant and adults in countless numbers. This was the only manure pile found away from the incinerators.

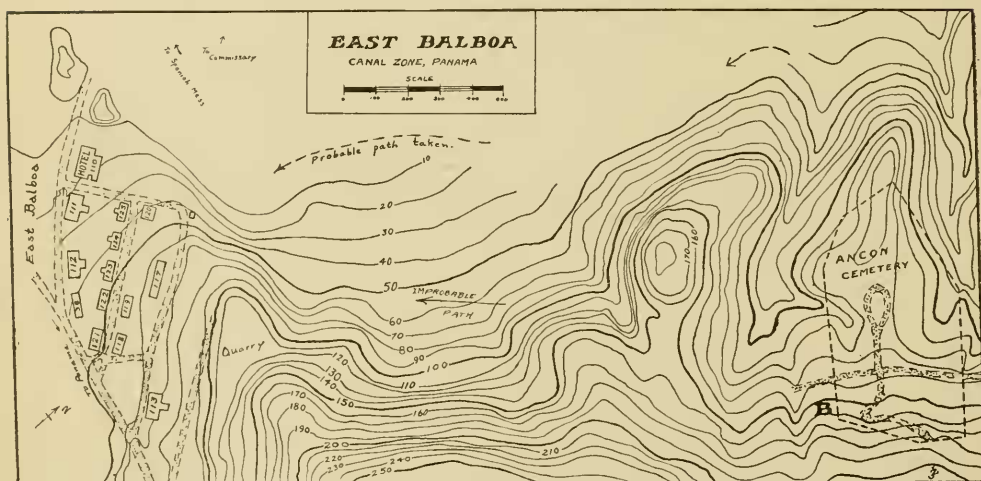


FIG. 1. Map of the region.

A pit was dug, into which was placed a small quantity of the infested manure. A cover of earth one foot deep was added as a protection from heat rays. Over this was placed a screened cage. On June 6th the cage contained about five thousand adult flies, most of them the common typhoid-fly. At 9:00 a. m. these were sprayed with an aqueous solution of gentian-

violet, to which a small amount of gum tragacanth had been added. (See Annals Ento. Soc. Am. Vol. VI, No. 1, pp. 5-21). These marked flies were liberated at 9:30 a. m. at the same place.

At the hotels, commissary and a few private houses, tangle-foot paper was used freely, and this was afterwards collected by the writer and examined for the presence of any marked flies. The method used was to wet each fly with a solution of alcohol and glycerine. The marked fly became known by the resolution of the tiny crusts of anilin dye adhering to its body. Seventeen marked flies were thus recovered, viz:

East Balboa Hotel, 4 ♂ *Musca domestica* from paper exposed for 32 hours after the sprayed flies had been liberated at the cemetery.

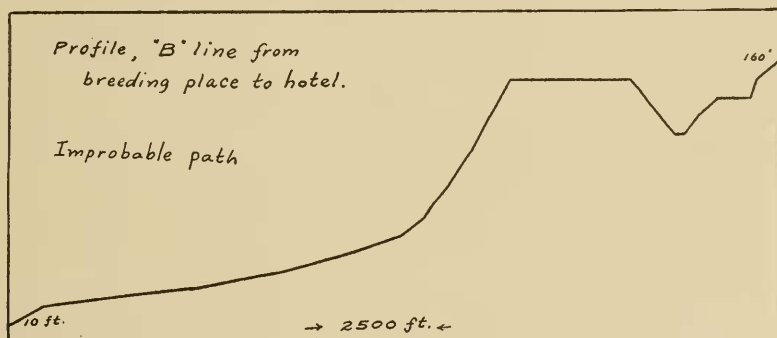


FIG. 2. Profile in direct line.

Spanish Mess, 9 (7 ♂, 2 ♀) typhoid flies from paper exposed 32 hours.

Commissary, 3 ♂ typhoid flies, from paper exposed 32 hours.

Spanish Mess, 1 ♂ typhoid fly, from paper exposed 75 hours (in reality 43 hours after last batch of paper was collected.)

No attempt was made to catch flies outside of these screened buildings, hence the 17 recovered adults represent only such as had gained entrance through holes in the screening or while the doors were opened and closed. The species found on the fly paper were mainly *Musca domestica* and *Hermetia illucens*, both of which breed freely in pit closets as well as in manure, and which were very plentiful upon cooked and uncooked food.

The probable path taken by the flies in this particular case was down the East and West gully along the cemetery, then along the lowlands to the Commissary and Hotels. The profile figured is made in a direct line from the breeding place to the hotel, but it seems hardly probable that this was the path actually taken. The former is the more likely one.

Thus it has been clearly shown that a mass of manure 2,500 feet from the hotels and 150 feet above them, was a menace to these places. The experimental results were augmented shortly after when this manure heap was completely destroyed. The flies at the Commissary and hotel quickly diminished in numbers.